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ABSTRACT

To better understand the complexity of organizational life as a cultural system whose members share particular values, attitudes, and ways of knowing, and to understand the role of women in this culture, a study was conducted using female managers at 12 high technology companies in California's "Silicon Valley." Informants were selected on the basis of accessibility with an aim toward including a cross section of employment areas, company size, age, and product or service. Other data were collected from observers of Silicon Valley, executive recruiters, and written sources. Findings indicated that the high technology industry has its own culture with corresponding values and attitudes. It is fast paced, action oriented, lucrative monetarily, and demanding of extreme time commitments. Youth and innovation were also found to be highly valued. Results suggest that high technology is more open to women because of the meritocracy, supply and demand ratio of talent, and the newness of the industry. Drawbacks discovered include the importance of a technical degree, the male bias in top management, and burn out. (CRH)

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THE CULTURE OF HIGH TECHNOLOGY:

IS IT "FEMALE FRIENDLY?"

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The concept of organizational culture has become popular in both academic and business circles. Academics and practitioners alike have joined the cultural bandwagon in an effort to try to better understand the complexities of organizational life.

In Search of Excellence has become the "corporate bible" of the eighties, while Deal and Kennedy's Corporate Cultures and Ouchi's Theory Z share center stage in popularizing the culture construct (17, 4, 14). Fortune magazine claims that "U.S. business is in the throes of a cultural revolution. Even some of the hardest-nosed managers have started worrying about the appropriateness of their corporate cultures" (3, p. 66).

In the academic arena, Administrative Science Quarterly devoted an entire issue to the subject and papers about organizational culture are gaining exposure at communication associations' conventions (13, 21, 2, 18). Pacanowsky and O'Donnell-Trujillo position the organizational culture approach to research as an alternative to the traditional scientific approach to studying organizations. They argue that the culture approach is uniquely communication-based and legitimates all organizational behavior as appropriate for study, not just managerial, task related characteristics (15).

An organization is viewed as a cultural system whose members share particular values, attitudes, and ways of knowing. Bormann defines cultures as "the sum total of ways of living, organizing and communing built up in a group of human beings and transmitted

to newcomers by means of verbal and nonverbal communication" (1, p. 50). Organization cultures consist of shared norms, rituals, corporate myths and stories, values, and attitudes.

Theorizing about organizations as cultures has, in the majority, adopted an intraorganizational perspective. Each organization is an idiosyncratic culture, complete with individualized ways of knowing and behaving. Non-academic writing has unanimously assumed this posture. Strong cultures are typically unambiguous in that organization members share the same attitudes, values, philosophies.

Some academic writings, however, have challenged this synchronous view by claiming that multiple cultures can exist in a given organization. Dotlich found that male and female managers belong to different rhetorical communities within the same organization and consequently experience the organization differently (6). Gregory found a multi-cultural perspective useful in understanding technical professionals in the computer industry. She claims that "many organizations can more correctly be viewed in terms of multiple, cross-cutting cultural contexts changing through time, rather than as stable, bounded homogeneous cultures" (7, p. 365). In a recent article, Van Maanen and Barley take an interorganizational stance by claiming that occupational communities are cultures. They define occupational communities as groups of people who do the same kind of work, identify positively with that work, and have social relationships that are closely tied to work (23). These communities are formed across organizational

boundaries; their conceptualization as cultures expands the organization-specific view of culture.

The research reported in this paper takes the culture construct one step further by examining a particular industry--high technology--from a cultural stance. In addition to examining the industry in general, this study focused specifically on one group of people in the high tech industry--women in management. Research questions that have guided this effort are: Is a high tech culture identifiable interorganizationally? If so, what are the values, norms, attitudes of that culture? Is that culture more favorable to women's managerial advancement than other more traditional kinds of industries?

High Technology. The rise of the high technology industry is nothing short of a revolution. The computer has become the focal machine of the information age, altering all aspects of life from education to leisure to medicine (12). The center of the computing and high tech industry is an area of northern California located between San Francisco and San Jose. Silicon Valley is a 30 mile long area of land that is home to Intel, Apple, Hewlett-Packard, Zilog, Xicor, and literally thousands of other companies that are in the business of high tech. The 1984 issue of Rich's Business Guide to Silicon Valley indexes over 2,200 companies that populate the valley and give it the highest concentration of high technology companies in the world (20). A high tech industry is characterized by: a workforce of highly skilled employees (many scientists and engineers); a fast growth rate; high research and development

expenditures; and a worldwide product market (19, p. 29). Books like Kidder's Soul of a New Machine and Hanson's The New Alchemists provide glimpses into the world of high tech (10). Deal and Kennedy describe high tech companies as work hard/play hard cultures (4, p. 113-115). Peters and Waterman discuss the action orientation of Digital and HP based on the "ready, fire, aim philosophy" (17, p. 155). The purpose of this paper is to further illuminate the world of high tech by examining its cultural trappings.

Women in Organizations. Women and men do not share equally in organizational power, influence, or rewards. Clearly today's organizations are run by men as they have been from the beginnings of bureaucracy. In her landmark case study, Kanter defines organizations as traditional patriarchies whose very structures have excluded women and other minorities from management levels. Her concept "homosocial reproduction" identifies the process by which those in power reproduce themselves in kind in an effort to reduce uncertainty at upper levels in the organization (9, p. 63). Kanter claims that the structural characteristics of power, opportunity, and numbers are responsible for women's unequal status in organizations.

Discrimination against women and other "different" persons may be unconscious and subtle. Discrimination may consist "simply of treating women differently than men" (24, p. 40).

How does the high tech industry compare to more traditional industries such as banking and manufacturing with regards to women's position in the hierarchy?

A recent study sponsored by Women in Electronics suggests that the number of professional and technical women in high tech is increasing. The survey was designed to provide empirical data about the role of women in electronics, a subject that has been virtually ignored by investigators. After collecting information about a number of career items from 245 women in Silicon Valley, the researchers concluded that women are making contributions in all job categories and employment areas (11). The findings reported in this paper add to the empirical data base about women in electronics.

Data Collection. This research adopts the basic assumption of the interpretive paradigm--that organizational reality is created through members' interactions. How organization members account for their actions--how they make sense of the organization--is an appropriate research focus (15, 5).

The primary data source was interviews conducted with women managers at twelve high tech companies in Silicon Valley. Informants were selected on the basis of accessibility with an aim toward including a cross section of employment areas, and company size, age and product/service (see Table I). Interviews were relatively unstructured and conversational and ranged between half an hour to an hour in length. The interviews were audio-recorded and later transcribed. In addition to these primary interviews, I also interviewed observers of Silicon Valley (consultants, writers, professors), executive recruiters or "headhunters," and various others who work in high tech. Data collection took place over a three month period.

Characteristics of the High Tech Culture. The most persistent and unambiguous characteristic to emerge from the data is the orientation toward action. A salient value in high tech is best represented by the imperative "do it." This "bias for action" derives from the nature of the business. Innovation is the key word in an industry where technical improvements and the ability to get these improvements to market are tantamount to survival.

New products and processes are constantly being developed and a major part of the business is to bring your innovation to the marketplace before your competitor does. In such a fast-changing and competitive market, the "window of opportunity" for either winning or losing is all a matter of timing. In this business, the "early bird" philosophy can make or break a company. There is little time for strategic long-range planning and decision-makers must act quickly and incisively.

> The phrase I remember most when I first came here was 'It's easier to ask forgiveness than permission,' meaning 'Do something,' and if it doesn't work out, then say you're sorry and start over again. (Nora, Marketing)

The emphasis is on action, not reaction. Those people who are able to "make it happen," the risk-takers who pioneer new ideas and come up with innovations are the heroes of the industry. Since the major competitive issue is technology, the innovators (heroes) are typically engineers and scientists.

> Technical background is certainly highly valued and rewarded. People who come into this environment with technical credentials are taken a lot more seriously. (Sandra, Training)

Competition for qualified technical persons is high in the Valley, accounting for the high rates of turnover among engineers, sometimes as high as 30 percent (19, p. 92). Competition, high turnover rates, a volatile market, and pressures to act, all combine to make the industry exciting.

> It's exhilarating and frustrating. It's very fast-paced; things move quickly. Decisions have to be made quickly. It can be boom today and bust tomorrow and boom next week. There's momentum and vitality and that's what I like about it. (Jo, Employment)

Other adjectives used to describe the high tech business are dynamic, stimulating, focused, progressive, and seductive. The industry is high energy and seduces people into making commitments to time and effort that would boggle the minds of motivation theorists.

Working long hours is a norm of the high tech culture. Along with the action orientation, commitment to working 50, 60, and 70 hours per week was a recurrent theme in the interviews. Informants discussed this time commitment rather matter-of-factly; it is part of the territory.

> The first six weeks I was a manager I worked from 7:00 a.m. 'til 2:00 a.m. every day for six weeks including Saturdays and Sundays. And I finally asked for my tenth wedding anniversary off, not the day, the evening, a Thursday evening. And they laughed at me. . . . But that's quite typical when you're on development. (Jane, Product Engineering)

The norm of this extraordinary time investment is maintained through peer pressure and the sheer amount of work to be done.

> There's tremendous peer pressure to work more than 40 hours. Peer pressure and pressure that you put upon yourself. In this environment you take on projects that you can't possibly get done and you say to yourself, 'Why did I do that?' . . . and you end up driving yourself bonkers in the process. (Manager, Company J)

> There is such satisfaction in getting things done. Nothing has ever been done before. That's part of the generation, that's part of (the founders') influence, it's part of the product. You can't say, 'This is the way we've always done it.' There's no precedent, there's no history for this. (Carol, Market Development)

Organizational structure supports the norm of long hours. Many high tech companies utilize matrix designs; others are highly decentralized. Meetings are the order of the day. One informant claimed that she spends her entire workday in meetings; her personal work tasks must consequently be done after regular hours.

Being on the cutting edge of technology provides a frontier spirit that is freewheeling and fiercely independent. The industry is non-union; top management is anti-union. One informant stated that her company's villians are "the communists and excessive government control." Another claims that "it's (the industry) as close to free enterprise as we'll ever get."

A distinguishing characteristic of the high tech industry, one that possibly helps to explain the time commitment and the ability to deal with the pressures, is its youth. The "movers and shakers" of high tech are typically in their 30's. With only one exception, all of the people I interviewed were under age 45. The industry's heroes, the entrepreneurs who have taken garage operations and turned them into billion dollar companies are just now approaching their fifth decade. The image of youth and vitality pervades high tech. It is a young industry populated with young people. According to a sales and marketing headhunter, the prime salespeople in the industry are in their late 20's and early 30's.

> I see a lot of has-beens. They chase that golden fleece . . . and before you know it, they're 40 years old and I really don't want to talk to them. Not when there's a nice, young, rosy-cheeked young boy or girl coming out of Stanford. This is a real young society and you have to look at the business: they like young people. They want good-looking, handsome, virile young men and women. They don't want a guy who's run-down-at-the-heels and a has-been. (Headhunter, Sales and Marketing)

Money is valued in the high tech culture. Salaries are high; tastes are expensive. A good salesperson in the business makes between $50,000 and $100,000 per year. Founders become millionaires overnight when their company goes public. The fairytale stories of these entrepreneurs are part of the folklore of high tech and reinforce the value placed on financial success.

Opportunities for Women in High Tech. The world of high tech appears to be more "female friendly" than other traditional industries. The opportunities for women to advance are based on meritocracy, the supply and demand ratio of talent, and the entrepreneurial nature and newness of the business.

According to Rogers and Larsen, meritocracy is the basis of high tech organizations. Work performance is the criterion for success. "It's not who you know, or who your parents were, or where you went to school, or what clubs you belong to" (19, p. 139). It's what you know and do that counts. Meritocracies provide an atmosphere where recognition and advancement are available to any employee willing to work hard and able to work well. Meritocracies do not discriminate by sex or social class; they challenge homosocial reproduction by rewarding outcomes, not social similarity.

> The real compulsion is to grow. You can't if you discount 50 percent of the human resources. That sounds kind of pollyannaish, but I think it's true. The profit motive is so strong and the motive to compete is so strong that it really almost overrides all of those other old biases. (Jo, Employment)

All informants spoke positively about opportunities for women in high tech in comparison to other businesses.

> The old prejudices that were once very common are no longer there in this business, probably less so than any other business. In banking, who knows whether you're doing a good or bad job. B of A could hire 200 idiots tomorrow and you would never notice a dent in their profit and loss or the productivity of the bank. This business is smaller . . . your efforts or achievements, or hard work . . . can see tangible results and there is tangible recognition for it. So when women come in and do a good job, there's no denying the fact. You can't deny that they did a great job, you can't sweep it under the carpet. (Headhunter, Data Processing)

In the words of one manager: "Opportunity knows no gender."

A second basis for the increased opportunity for women is the demand for labor. The industry is growing at such a rapid pace that there just are not enough talented workers to go around. Company F, for example, is growing at a 30 percent rate per year. At that rate, the organization doubles every three years.

The need for qualified employees has forced the industry to tap an alternative labor resource--women. These opportunities would not be available if the industry were not growing so quickly.

> The environment is interesting because it is so dynamic and demanding. They're so hungry for good people that they will take on women. And at the same time, you have a very severe male mental set--it's engineering--it's male. (Manager, Company J)

The entrepreneurial nature of the high tech industry eliminates some of the barriers that prevent women from advancing in more traditionally structured organizations.

> Women do best in an entrepreneurial setting where they are given room to show what they can do. This is not possible in a bureaucratic setting. (Mary, Project Engineering)

> I think it (high tech) allows women to advance if they are competent enough. I don't think there are any kinds of barriers that women can't cross. I think in more traditional kinds of businesses it was more a man's society and I think in high tech that's changed. (Alice, Accounting)

The management style that typifies high tech companies is people-oriented. The workforce is, for the most part, well-educated and self-motivated. Traditional authoritarian management is not appropriate for this group of workers nor for the entrepreneurial setting which encourages participative decision-making and problem-solving.

The fast-paced and highly uncertain environment requires "shoot-from-the-hip" management and "firefighting."

> I think firefighting is rewarded more than problem-solving or more than planning. The people who fix it get rewarded more than the people who prevent it from happening. (Nora, Marketing)

A major criterion for dealing with this kind of environment is flexibility--being able to adapt to situational variables. Tom Peters, author of <u>In Search of Excellence</u>, claims that we are experiencing a revolution in the way we think about managing. The manager as traffic cop and nay-sayer is part of the past. The new manager is an "enthusiast, nurturer, facilitator, and

cheerleader" (16). All of the managers I interviewed described their styles in terms of participation, open communication, and supportiveness.

> I don't believe in beating anybody over the head for making mistakes. But I do believe in lots of praise and letting people know when they're doing a good job. I'd rather have a more positive than critical approach. (Eileen, Product Test Engineering)
>
> It's different for each of my subordinates. I attempt to be participative . . . and accommodate what they need. (Jo, Employment)
>
> It's very much a participative style. I want my people to make their own decisions. (Pat, Technical Training)

Along with the entrepreneurial nature, the newness of the industry encourages more equal participation by women. Organizational structures tend to be flatter, eliminating some of the problems inherent in advancement in a multi-leveled hierarchical structure. Smaller companies are particularly conducive to women's advancement because of their opportunities for high visibility. In addition, because the industry is new, the "old boys' network" is not as firmly entrenched.

> It's not unionized and there isn't really a formal old boy network, which is good. . . . I have never felt any overt prejudice against me for being female and I've never felt discounted in a business setting for that. I've never felt that I was being taken less seriously because of my gender. (Jo, Employment)
>
> The reason that women are in that profession (computer science) is that it started in the last 10 years. If it had started 400 years ago, women wouldn't be in it any more than they are in cattle farming. These are new industries. Kansas City Power and Light will probably never have a women engineer. (Jane, Product Engineering)

Finally, one male manager attributed women's opportunity in high tech to the differences between the new electronics age and the dying mechanical age. From a Tofflerian perspective, the new age requires a different kind of thinking--more systemic and less linear and mechanistic (22). A well-rounded representation of people is necessary to achieve a new, wholistic viewpoint. The electronics age also eliminates physical differences that existed in the mechanical age when strength was an important job requirement.

> When you get to the entirely intellectualized, non-physical aspect of the electronic age, all those differences disappear. Now you get a much more equal contribution and therefore people will be recognized much more for what they can contribute to the industry. (Manager, Company C)

Caveats. The high tech industry offers opportunities for women, but it does have drawbacks. Those drawbacks include: the importance of a technical degree; the male bias in top management; and burn-out.

The most direct route to success in high tech is via technical expertise. This is a major drawback for women since so few have degrees in math, science, and engineering. Women comprise only 4½ percent of all engineers in the U.S. A number of the nontechnically trained managers expressed concern about their backgrounds.

> The uphill fight in the industry has to do with credentials, and credentials have to do with an electrical engineering degree. (Jo, Employment)

> My position is probably undercut more by the lack of technical background than by the fact that I'm a woman. (Sandra, Training)

Due mainly to the lack of a technical background, the majority of women in management are in staff functions: personnel, training, public relations. Not having the appropriate credentials excludes them from the mainstream of the industry, and consequently from the most direct paths to the top.

The second drawback follows, understandably, from the first. Top management in high tech is almost exclusively male. This monopoly affects women's opportunities even if they have the necessary technical training.

> Top management doesn't have a lot of experience with women managers and probably is uncomfortable with someone different. (Jo, Employment)

> You can easily rise up to a certain level, but then you start meeting some major barriers to being accepted at the top levels. (Manager, Company J)

There are three levels of engineering project managers at Company A. Mary quickly advanced to the second level, but sees another level promotion in the far, far distant future, if at all. She feels that her chances of managing a group of project managers (predominantly male) are quite slim.

The standard grade level for men in engineering at Company J is 10 or 11. Pat could not think of any women in the entire organization who have attained that level.

The final drawback is the high personal cost of "making it" in high tech. The work norms, the pressure, and the excitement can be costly. The divorce rate in Silicon Valley is much higher than the national average, and workaholism is rampant (19, p. 157).

> High tech is a burn-out situation . . . because it's so exciting. But pretty soon the body, no matter what age, says 'enough already.' There's a burn-out period at about three years that takes its toll. (Carol, Market Development)

Conclusion. The high technology industry has its own culture with corresponding values and attitudes. It is fast-paced, action oriented, seductive, lucrative, extracts extreme time commitments, and values innovation and youth. As suggested by this exploratory study, the industry offers a place for women to succeed. The informants for this project were motivated, ambitious, articulate; and come from diverse educational and professional backgrounds (see Table II: Career Paths). These managers are part of the growing number of women who are finding success in this new industry. High technology is the industry of the future--the industry of "the third wave." An examination of its culture offers the vision of a more equal place for women in its workforce.

Table I

High Tech Companies

	Major Product/Service	Number of Employees In Silicon Valley	Age of Company in Years	Informant
A	Research and Development: Electric Power	750	10	Mary, Project Manager
B	Hardware: Computers and Computer Systems	30,000*	46	Nora, Marketing Manager
C	Software: Government Contractor	175*	23	Sandra, Training Manager
D	Hardware: Radar Warning Systems	2,000	25	Marge, Security Manager
E	Hardware: Custom Memory Systems	135	5	Alice, Accounting Manager
F	Hardware: Mini and Micro Computers	600*	27	Ann, Finance Manager
G	Systems-Custom Designed	17	<1	Eileen, Product Test Manager
H	Telecommunication Systems	5,000	15	Jane, Product Manager
I	Semiconductor Devices	1,500*	18	Jo, Employment Manager
J	Microprocessor and Memory Systems	20,000	16	Pat, Technical Training Manager
K	Video Teleconferencing Systems	95	7	Teresa, Personnel Manager
L	Hardware: Computers	2,000*	8	Carol, Account Manager, Market Development

*Company has offices in other parts of the United States and/or abroad.

Table II

Career Paths

Mary has worked for Company A for four years. Her educational background is physical chemistry. She is one of four women project managers out of a force of 300. She used to enjoy being the lone woman at a meeting--it was testimony to her accomplishment. Now she finds it uncomfortable.

Prior to joining Company B four years ago, Nora recruited blood donors for the Red Cross for 10 years. She is now the telemarketing manager for the personal computer group. "You have to know how to play the game here. . . . knowing what everybody's role is and being sensitive to that."

Sandra joined the high tech industry for money and potential. She has a degree in English ("not the most saleable degree in the world") and has worked previously in writing, editing, and research. She joined Company C as a technical writer and is now manager of the multi media training group.

Marge has worked for Company D for 16 years, working her way up through the ranks to become manager of government security. This company was one of the older companies I visited. It's strong ties to government tend to make it more traditional. There are very few women in management here.

Ann transferred to Silicon Valley from a branch office in Colorado. She is the only female manager in finance and has been with the company for seven years. "You de-emphasize your femininity, your difference between the males. You have to be seen as part of the rest of the group." Ann received an MBA last year.

Alice started working in high tech four years ago upon receiving a B.S. in accounting. She was promoted to management after two years on the job. She has been with Company E for two years and is the manager of all accounting functions.

Eileen is one of the co-founders of Company G. She has been involved with the electronics industry since the mid-60's as a consultant, instructor, programmer. She has a Master's degree in engineering from Stanford.

"When I went to school, there was one woman in each grade. When I got to graduate school, there were enough for a women engineers' hockey team." Jane has a Master's degree in systems engineering and has worked for a number of different high tech companies in the U.S. and Canada. She has worked for Company H for 18 months.

Jo left a marketing job at one high tech firm to join the Human Resources Development group at Company I. She sees another job move to a different organization in her future. "It's interesting to be in that segment of industrialized America that's on the edge. I'd rather be here than at a steel plant or an automotive plant."

Pat started to work for Company J as a clerical when she graduated from high school 10 years ago. She now manages the technical training function. "I still don't see a very strong career path for me. In five years. I don't want to be in a stereotypical female role."

A headhunter contacted Teresa while she was a secretary in employee relations at a large high tech firm. She was hired at Company K as an assistant to the Personnel Manager, then was promoted to manager when her boss left. She's been in her present job for three years.

Prior to joining Company L five years ago, Carol worked in education research at Stanford. Her formal education is speech therapy. "It's great working in industry because things get done."

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